

Appl. No. 10/697,137
Reply to Office action of 09/30/2004

REMARKS

Reconsideration of the above-referenced application in view of the above amendment, and of the following remarks, is respectfully requested.

Claims 1-12 are pending in this case. Claims 1, 3, 7 and 12 are amended herein.

The Examiner rejected claims 7-12 under 35 U.S.C. 102(b) as being anticipated by Filipiak et al. (U.S. Patent 5,447,887).

Applicant respectfully submits that amended claim 7 is unanticipated by Filipiak as there is no disclosure or suggestion in the reference of doping a copper interconnect with silicon without forming a silicide. Filipiak teaches forming a silicide layer at the surface of a copper interconnect rather than doping the copper interconnect with silicon without forming a silicide as required by the claim. As noted in paragraph [0026] of the specification, "the doping levels of the instant invention do not result in silicidation at the copper surface." Accordingly, Applicant respectfully submits that claim 7 and the claims dependent thereon are unanticipated by Filipiak.

The Examiner rejected claims 1-2 and 4-11 under 35 U.S.C. 102(b) as being anticipated by Ngo et al. (U.S. Patent 6,211,084).

Applicant respectfully submits that amended claim 1 is unanticipated by Ngo et al as there is no disclosure or suggestion in the reference of gaseously doping the copper film with silicon without forming a copper silicide. Ngo teaches forming a copper silicide

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layer at the surface of a copper interconnect. Ngo does not disclose or suggest doping the copper with silicon without forming a copper silicide. Accordingly, Applicant respectfully submits that claim 1 and the claims dependent thereon are unanticipated by Ngo.

Applicant respectfully submits that claim 7 and the claims dependent thereon are similarly unanticipated by the reference.

The Examiner rejected claim 3 under 35 U.S.C. § 103(a) as being unpatentable over Ngo et al. (U.S. Patent 6,211,084). Claim 3 is amended to be in independent form.

Applicant respectfully submits that amended claim 3 is patentable over Ngo et al as there is no disclosure or suggestion in Ngo of the doping step doping a surface of the copper film that leads to a final bulk silicon concentration in the range of 0.03 at. % to 0.5 at. %. The Examiner argues that it would be obvious "to specify the range as claimed by routine experimentation because there is not evidence of criticality." The critical difference is found in the formation of silicide by the reference where none is formed using the claimed limitation. As noted in paragraph [0026] of the instant specification, "the doping levels of the instant invention do not result in silicidation at the copper surface. At ~400°C, the solid solubility limit of Si in pure Cu is ~ 8 at. %. This is well above the levels of the instant invention." Because Ngo teaches forming a silicide at the surface, there is no suggestion to use the claimed range which would not result in the formation of a silicide. Accordingly, Applicant respectfully submits that claim 3 is patentable over the reference.

The other references cited by the Examiner have been reviewed, but are not felt to come within the scope of the claims as amended.

In light of the above, Applicant respectfully requests withdrawal of the Examiner's rejections and allowance of claims 1-12. If the Examiner has any questions or other

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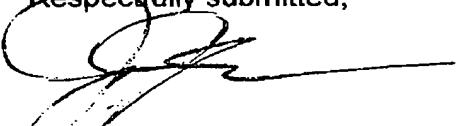
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correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,



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